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John Johnson, strategic marketing and acquisition integration manager, at 908 Devices talks to Gwyn Winfield about bring FTIR onboard

Catching a

Sometimes detector acquisitions are like buses, you wait ages for one… then they all come at once. At the end of 2022 Bertin announced the acquisition of Environics, adding the latter's point chemical detection to the former's radiological, biological and standoff chemical detection capabilities. Perhaps not on the same scale, but of equal import was April's announcement that 908 Devices was going to buy RedWave Technology. 908 Devices is best known for the MX908 high pressure mass spectrometer (HPMS), which was launched in 2017, while RedWave is a relatively new kid on the block (albeit with well known faces!) that launched its range of Fourier transform infrared (FTIR) devices in 2020 with ThreatID. This drew together a highly specialised mass spec, that might be brought in once an incident is declared, with a detection device that could be utilised to declare the incident in the first place. A spectrum of chemical detection, ranging from specialist to expert, was combined in a single company.

The acquisition also provides opportunities for cross selling equipment. While 908, Inficon and FLIR might tell you that every department should have a MS, the assumed cost and training burden means that many hazmat and other responders tend to rely on the lower tier of identification capability, such as Raman and FTIR. With the acquisition of RedWave, delivering shared training, 24/7 support, and a single sales team, 908 Devices can now offer a broader capability and try to encourage existing customers at one or other end of the spectrum.

The question now is where does 908 Devices stop? Does it double down on chemical detection, identification and monitoring (DIM), and perhaps get into the ion mobility spectrometry or photo ionisation detection side, or, through its existing bioprocessing side, go 'left field' and into biological detection? Does 908 see itself as a hazardous chemical DIM company, or is it hoping to become a CBRN player, and perhaps try and take on the likes of Bertin Environics or Teledyne FLIR?

John Johnson (aka JJ), strategic marketing and acquisition integration manager, at 908 Devices, has a long history in chemical detection for public safety. He started off with SensIR, which Smiths Detection bought in 2003 to gain control of its HazmatID FTIR. Next, he went to work for Ahura Scientific, with its revolutionary First Defender… which was bought by Thermo Fisher in 2010. From there he launched ANDE which introduced Rapid DNA to first responders and had a brief spell with Block Engineering and its pulsed quantum cascade lasers.

It's a rare piece of chemical detection that hasn't been through JJ's hands! Perhaps due to this personal experience, he views the evolution of 21st century chemical detection in a particular light. "In those first years of bringing FTIR to market, no one had seen anything like it. The market dynamic was changed, allowing Raman to enter, which would never have happened had we not launched FTIR. Mass spec would also have had a much harder adoption phase without this evolution of technology. These two technologies have a really natural, comfortable fit, HPMS offers a range of capability trace identification on a very select group of under 200 substances, and we want to know everything about them.

"FTIR, on the other hand, has 28,000 compounds in its library and we can look at thousands of compounds at a bulk level. It gives us this trace to bulk capability to offer our customers. RedWave has built FTIR technology really well but we also found that it has this new technology with gas FTIR, which has been tried many times but has never taken off in the market. Previously you would buy FTIR for liquid and solids, not for gas as it was too difficult to use. You had to grab a tedlar bag, bring it back to the device, and push it through… but if you missed the sample you had to go back again, imagine having to transit through the decon line with a bag of gas, do it twice and the application becomes challenging. Whereas, a handheld device operating in continuous mode, gives the XplorIR analyzer a new dimension to the FTIR gas identification market. This has been a gap for HPMS, which is great at vapours and aerosolised compounds, but doesn't do gases. These technologies have a robust compatibility that gives first responders a much broader picture and knowledge of their situation than they had before. As we work on bringing this to market, we are also developing reachback to provide them with that contiguous support as they use one technology for one problem or another."

As regards what's next, JJ stated they were still at the start of a customer-led process. "We have great customer connectivity at pretty much all levels and we don't think we want to lose that. It surprises people when they see how close we are to our customers and when you move to larger, programmatic levels there is risk that you lose a sense of that, because now you're in large military programmes. I don't know if we want to head in that direction, but if our customers want us to go there we probably will. That said, I don't think we'll ever lose sight of the one to one relationships we have with the cop in Oklahoma, or the custom officer in New Zealand.

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(Red)wave

"Our goal is to provide end to end chemical analysis for the field and be leaders in that space. The acquisition of RedWave is a start and says, 'these guys aren't one dimensional anymore'. We're really looking to expand this market and don't see a lot of other players doing that right now. It's natural for large companies to look at it and say, 'yeah, this is a rounding error in our portfolio. It's not really a focus.' Whereas it's not a rounding error for us, it's our market. We certainly have a life sciences component to our business, which is exciting and fun, but we're dedicated to the field forensics and public safety market."

The example par excellence of a company that just decided to leave the CBRN/public safety space as too complicated and too small is 3M. Its highly successful respirator business was shut, seemingly on a whim. There's no debating that CBRN is a complicated market as there are never enough incidents to see move it to the top of everyone's priority list, and even when that happens it is not there for long. Unless you are prepared to shift with the currents, and keep close to the customer for the moment that budget arrives, it is going to be a sector rife with disappointment.

In fairness 908 Devices is coming at it from the difficult end of the pool. As mentioned earlier, the customer market for MS is small, and there is a range of products each with its own key selling point snapping at 908's market share. Equally the military sector, which tends to be the big customer, is shifting away from boutique solutions to clandestine labs and terrorists setting off VX missiles from Alcatraz. While that will remain an element of their focus, Putin's actions in Ukraine has brought the traditional, gallons of mustard, back into view. Now, instead of being able to identify an analogue of methyl-ethyl-deadbynoon, there's a limited palette of chemical warfare agents, which don't require a device as sophisticated as the MX908. While 908 Devices has a less sophisticated piece of detection equipment, albeit still not an LCD-esque chemical weapon agent detector, is it a mark of this switch? To stop the company being left behind by strategic events, does it needed to branch out?

JJ suggested that responders and customers adapt. What seems complicated and difficult becomes second nature once applied in the field. "The proliferation of devices is a function of their ease of use. Can we make it as effortless as possible for somebody to



908 Devices launched their Beacon product after they found their MX908 secured to lampposts at high visibility events ©DoD

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Catching a (Red)wave

continue to use, operate, maintain and support the device over longer periods of time? Probably the easiest to use is FTIR, it's very simple, there are very few hazards and in terms of spectroscopy equipment, it has the largest libraries you can work with. Raman is a little bit more challenging as you have to pay attention to what you're sampling or you might cause an explosion, and there are things like eye hazards. In the early days of Raman there was always a big concern, 'oh, these will never proliferate because of the eye safety issue,' or EOD will never use them as you can potentially ignite a substance.'

"All that disappeared once it reached the users and they started to deploy it. The concerns over how hard or how dangerous things might be went away once it reached the hands of the guys who really needed it in the field, and experienced its value. The same applies with mass spec, we're seeing users go through this transitionary experience. It requires a little more learning and training, but as the market adopts the technology and you see specialised military CBRN units start to transition into supporting drug trafficking operations, then the device begins to appear in customs. Our biggest customer in the US military is EOD. They use it for the multi-hazard threat. They're worried about explosives, but what happens if the explosive device is attached to something that might trigger something else in that situation? It's why we're seeing a much larger proliferation within military circles beyond a standard CBRN response."

That said, JJ confirmed that they were looking at future iterations of HPMS, that might differ from the original. He offered as an example, the MX908 Beacon, which emerged from watching first responders affix their HPMS to lamp posts for sporting events or VIP visits. Seeing this, the system was time optimised to be used for extended durations to detect any hazardous aerosols and feed that information back to a command post. "As we look at the market, is there a place for a potentially lower, smaller, simpler version of device? Absolutely there is, and as we consider the next generation device, for sure, we're looking at that. But there also seems to be a whole area, like ad hoc area monitoring, where we're only just starting to scratch the surface."

In addition to RedWave, 908 Devices' other iron in the fire is the next generation chemical detector, aerosol and vapour chemical agent detector (AVCAD). They are partnered with Smiths Detection on this, and if previous DoD CWA detector programmes are anything to go by, you'll be seeing a lot more of this if they make it work. JJ points out that AVCAD is a Smiths Detection contract, but 908 will be interested in any other federal contracts needing a HPMS or FTIR.

In terms of marketplace challenges for 908 Devices, for JJ it is the big picture, what happens when government attention is directed to other elements in the budget. "The public safety market is subsidised 100% with government funding to buy equipment for such applications and capabilities. What does that look like in the future? How much longer can we see growth out of the public safety and military markets? Downturns in the economy would typically be a concern for many companies, but far less concerned as we're seeing transitions toward efficiency in our customer base, ways to do more with less. It's a new dynamic, particularly with regards to law enforcement, where technology that was traditionally used in labs that received samples requiring weeks to obtain results, is now leveraging more technology in the field, and that provides cost savings. Sometimes even with a downturn in the economy, there's a gain of efficiency for customers. So, if you're right and the military slows down a little bit, which I don't foresee, this part of the market is getting more interesting, there is excitement in customs and law enforcement through the adoption of these technologies. We have a lot of room to grow."



Adding FTIR to the 908 stable means a better integrated reachback service ©908Devices

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